

CLAIMS

1. In a two cycle internal combustion engine having housing means to provide the necessary spaces in the engine, compressor means to force combustible material into the engine, fuel injection means to inject fuel into the engine for combustion, reciprocating means to compress combustible material held within said housing means between the compressor means and the reciprocating means to cause detonation of said combustible material, wherein the improvement comprises the compressor means can compress more combustible material to the combustion process after detonation commences.
2. A two cycle internal combustion engine as defined in claim 1 wherein the reciprocating means includes crankshaft means to cause reciprocating motion of a reciprocating part, receive a power transfer from the reciprocating part during combustion, and output engine torque.
3. A two-cycle internal combustion engine as defined in claim 2 wherein said crankshaft means includes output shaft means to output engine torque.
4. A two-cycle internal combustion engine as defined in claim 3 wherein the compressor means include output shaft means to output and receive engine power.
5. A two cycle internal combustion engine as defined in claim 4 wherein the improvement comprises power transfer means rotatably connecting said crankshaft output shaft means to said compressor output shaft means for a transfer of power between them.
6. A two-cycle internal combustion engine as defined in claim 5 wherein the compressor means is comprised of a positive displacement gear type air compressor to compress combustible material into the engine.
7. A two cycle internal combustion engine as defined in claim 6 wherein said housing means includes cylinder means to confine the movement of the reciprocating means.
8. A two cycle internal combustion engine as defined in claim 7 wherein the reciprocating parts include piston means, piston pin means and connecting rod means with said piston means connected to said piston pin means and the piston pin means rotatably connected to said connecting rod means and the connecting rod means rotatably connected to the crankshaft means for a transfer of power between the crankshaft means and the connecting rod means.
9. A two-cycle internal combustion engine as defined in claim 8 wherein the improvement comprises an exhaust passage means connected between an exterior wall of the housing means and said cylinder means for the release of exhaust gases contained within the cylinder means.
10. A two-cycle internal combustion engine as defined in claim 9 wherein the improvement comprises intake passage means connected between an exterior wall of the housing means and the interior housing space confining the compressor means for passage of combustible material to the compression means.

11. A two-cycle internal combustion engine as defined in claim 10 wherein the improvement comprises passage means connecting the outlet of the compressor means to the cylinder means.
12. A two-cycle internal combustion engine as defined in claim 11 wherein the improvement comprises a fuel injector located within the housing means for injection of fuel into the housing means.
13. A two-cycle internal combustion engine as defined in claim 12 wherein said fuel injector injects fuel between the compressor means and the reciprocating means.
14. A two cycle internal combustion engine as defined in claim 13 wherein the improvement comprises a fuel igniter located within the housing means to ignite combustible material within the housing means between the compressor means and the reciprocating means.
15. A two-cycle internal combustion engine as defined in claim 14 wherein the improvement comprises intake and exhaust valve means to control the flow of fluids moving between engine housing spaces.
16. A two cycle internal combustion engine as defined in claim 15 wherein said valve means includes valve port means formed in the housing means between the compressor means and the cylinder means and a valve to cover said valve port means to control the flow of fluids moving between the compressor means and the cylinder means, and between the cylinder means and the exhaust port means.
17. A two cycle internal combustion engine as defined in claim 16 wherein the improvement comprises oil pump means to pump lubricant to moving parts of the engine
18. A two-cycle internal combustion engine as defined in claim 17 wherein the housing means includes cooling passage means to contain engine coolant and provide a means to remove excess heat from the housing means.
19. A two cycle internal combustion engine as defined in claim 18 wherein the improvement comprises bearing means to provide support to rotating parts.
20. A two cycle internal combustion engine as defined in claim 19 wherein the improvement comprises throttle means to control the supply of gas entering the intake passage means so the combustion process can be controlled.
21. A two cycle internal combustion engine as defined in claim 20 wherein said positive displacement gear type air compressor includes two gear shafts divided into five separate gear pumps to pump all the working fluids the engine uses, air, coolant, oil, and fuel having a air compressor to compress air into the engine, a gear pump to each side of the compressor gears to pump engine oil, and beside one said oil gear pumps a coolant gear pump to pump engine coolant, and beside the other oil gear pump a fuel gear pump to pump engine fuel.
22. A two cycle internal combustion engine having housing means to provide the necessary spaces in the engine, compressor means to force combustible material into the engine, fuel injection means

to inject fuel into the engine for combustion, reciprocating means including crankshaft means to compress said combustible material held within said housing means between said reciprocating means and said compressor means to cause detonation of the combustible material so the compressor means can compress more combustible material into the combustion process after detonation commences, wherein the improvement comprises said housing divided into three sections along two parallel planes, one plane intersecting the axes of the gear shafts of the compressor means and the second intersecting the axis of said crankshaft, and said three housing sections held tightly together by fastening means.

23. A two cycle internal combustion engine having housing means to provide the necessary spaces in the engine, compressor means to force combustible material into the engine, fuel injection means to inject fuel into the engine for combustion, reciprocating means to compress combustible material held within said housing between said reciprocating means and said compressor means to cause detonation of said combustible material so the compressor means can compress more combustible material into the combustion process after detonation commences, wherein the improvement comprises valve means to control the movement of fluids within the engine.

24. A two cycle internal combustion engine having housing means to provide the necessary spaces in the engine, compressor means to force combustible material into the engine, fuel injection means to inject fuel into the engine for combustion, reciprocating means to compress combustible material held within said housing between said reciprocating means and said compressor means to cause detonation of said combustible material so the compressor means can compress more combustible material into the combustion process after detonation commences, wherein the improvement comprises ignition means to control when combustion begins.

25. A two cycle internal combustion engine having housing means to provide the necessary spaces in the engine, compressor means to force combustible material into the engine, fuel injection means to inject fuel into the engine for combustion, reciprocating means to compress combustible material held within said housing between said reciprocating means and said compressor means to cause detonation of said combustible material so the compressor means can compress more combustible material into the combustion process after detonation commences, wherein the improvement comprises throttle means to control the flow of combustible material into the engine.

26. A two cycle internal combustion engine having housing means to provide the necessary spaces in the engine, compressor means to force combustible material into the engine, fuel injection means to inject fuel into the engine for combustion, reciprocating means to compress combustible material held within said housing between said reciprocating means and said compressor means to cause detonation of said combustible material so the compressor means can compress more combustible material into the combustion process after detonation commences, wherein the compressor means is comprised of a positive displacement gear type air compressor to compress combustible material

into the engine.

27. A two cycle internal combustion engine having housing means to provide the necessary spaces in the engine, compressor means to force combustible material into the engine, fuel injection means to inject fuel into the engine for combustion, reciprocating means to compress combustible material held within said housing between said reciprocating means and said compressor means to cause detonation of said combustible material so the compressor means can compress more combustible material into the combustion process after detonation commences, wherein the improvement comprises power transfer means rotatably connecting the compressor means with the reciprocating means for a transfer of power between them.

28. A two cycle internal combustion engine having housing means including cylinder means to provide the necessary spaces in the engine, reciprocating means to output engine power and force combustion products out of the engine, compressor means to force combustible material into the engine head and compress it there, intake valve means to control fluids passing into the cylinder, wherein the improvement comprises fuel injection means to inject fuel into the engine head upstream of the intake valve to cause combustion to commence within the engine head.

29. A two-cycle internal combustion engine as defined in claim 28 wherein the improvement comprises valve means having valve stems passing between the rotating part of said compressor means.

30. A two cycle internal combustion engine as defined in claim 29 wherein the improvement comprises overhead camshaft means driven by the compressor means.

31. A two-cycle internal combustion engine as defined in claim 30 wherein the improvement comprises intake and exhaust valve means actuated by said overhead camshaft means.

32. A two cycle internal combustion engine as defined in claim 31 wherein the improvement comprises combustion passage means located between the compressor means and the valve means intake valve head.

33. A two-cycle internal combustion engine as defined in claim 32 wherein the improvement comprises fuel injection means to inject fuel into said combustion passage means.

34. A two-cycle internal combustion engine as defined in claim 33 wherein the improvement comprises a camshaft compartment divided along the axis of the camshaft.

35. A two cycle internal combustion engine as defined in claim 34 wherein the improvement comprises spark ignition means located within the engine housing to ignite the fuel mixture compressed within said combustion passage means.

36. A two cycle internal combustion engine as defined in claim 35 wherein the improvement comprises a gear train compartment formed within one end of the engine housing means to contain a camshaft gear drive train rotatably connecting a compressor gear drive gear to a camshaft drive gear.

37. A two-cycle internal combustion engine as defined in claim 36 wherein said camshaft drive gear train includes a crankshaft driven gear fixedly attached to one compressor gear shaft so the crankshaft can drive said compressor gear shaft.
38. A two-cycle internal combustion engine as defined in claim 37 wherein the compressor includes a positive displacement gear type air compressor to compress combustible material into the engine.
39. A two cycle internal combustion engine as defined in claim 38 wherein said positive displacement gear type air compressor is divided into four separate gear pumps, two inner gear pumps to compress combustible material into the engine and two outer gear pumps to pump oil to engine parts requiring lubrication and to reduce the wear of the two main compressor gears.
40. A two cycle internal combustion engine as defined in claim 39 wherein the improvement comprises cooling passages located within the engine head to cool engine head combustion passages, exhaust passages and valves.